Reconsidering current objectives for physical activity within physical education

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Abstract
Children's participation in physical activity (PA) has important positive benefits for their health and academic outcomes. Within the school day, physical education (PE) is increasingly endorsed as a key time for children to accumulate PA. Despite this increasing emphasis, research papers and policy documents frequently identify PE lessons as 'not active enough'. However, contemporary objectives for sufficient PA in PE may not be based on the highest quality evidence. Furthermore, while the objectives appear compatible, they contain profound differences. Continued pursuit of these objectives may be detrimental to achieving positive experiences of PA in PE. For instance, an exclusive focus on PA objectives may encourage teachers to prioritise fitness-based activities over others that young people enjoy. Pursuing short-term goals for PA also risks investing limited lesson time to develop important elements of physical literacy that only become developed after prolonged engagement and practice. Importantly, what is at stake is not only achieving sufficient PA in PE, but also encouraging lifelong participation in PA and the long-term health of today's children.

Even though physical activity (PA) contributes to better health, many young people fail to achieve the target of 60-minutes per day (1). The whole school day, and within that Physical Education (PE), are increasingly seen as important opportunities to accumulate PA (1-3). Paradoxically, even though school days including PE are more active than those that are not (3), PE is frequently identified as insufficiently active (4). Research papers and policy documents commonly use two objectives, advocated by organisations within the UK (3) and the USA (5), to ascertain if PE is active enough (Table 1). However, each objective lacks grounding in contemporary evidence and, despite assumptions of their equivalence, contain profound differences. Furthermore, over-diligent pursuit of these objectives by research and policy may result in teachers prioritising fitness-based activities over others, such as those that develop physical literacy (6). This is despite increased fundamental movement skill competency, a key component of physical literacy, predicting increased adolescent PA (6).

Table 1: A summary of objectives to increase activity within physical education

Organisation	**Objective for 'sufficient' PA**
Association for Physical Education (AfPE) (3)	Students should be *actively moving* for at least *50-80%* of the available learning time
The U.S. Department of Health and Human Services (HHS) (5)	Students should engage in moderate-to-vigorous physical activity (*MVPA)* for ***>50%*** of the time they spend in PE class

The evidence underpinning current objectives (Table 1) is anachronistic, particularly as objective measures of PA are now used to evaluate PA in PE (4). The Association for Physical Education (AfPE) objective fails to cite evidence that informs the recommended duration and intensity of PA in PE (3). The US Department for Health and Human Services (HHS) objective is based on a combination of evidence - all of it low quality; self-reported time spent playing sport, expert advice, interpretations drawn from behavioural theory and a selection of exemplary practice (2,7). This misalignment, predominantly arising from the discrepancy between self-report and objective measurement of PA, may be one explanation why few contemporary PE lessons are deemed *'active enough'* (4,8).

A plethora of research, including our own (8), fails to recognise and/or acknowledge these important differences between objectives. This issue is best illustrated by a recent meta-analysis (4), which concluded; objectively measured PA during PE met neither the HHS nor the AfPE objectives for >50% of PE in moderate-to-vigorous physical activity (MVPA). However, Table 1 clearly shows how only HHS specified a threshold of MVPA intensity.

As we move towards research informed practice, it is essential that objectives for PA in PE are appropriate. The uncompromising pursuit of these objectives by research and policy (4,8) is concerning as it may cause teachers to focus on PA, at the expense of fostering an enjoyment of PA or developing physical literacy (2,6). This pursuit has already led to unsubstantiated calls by OFSTED (within the UK, 9) for teachers to engage pupils in sustained periods of high-intensity PA. However,

adherence literature demonstrates how sustained, high intensity PA can reduce subsequent motivation for PA.

A contextualised example highlights the difficulties a teacher may face when trying to achieve the multifaceted outcomes of PE. Imagine this common lesson scenario; the teacher asks pupils to consider how to effectively penetrate a defence in an invasion game. In addition to being *'active enough'*, children must consider a tactical appreciation of the task, communicate with teammates, allocate roles and responsibilities, and review their success. In this example, the teacher is pursuing an appropriately wide range of learner experiences, alongside encouraging PA. While some of this lesson content may have caused inactivity - and conflict with PA objectives - it may be essential to develop the physical literacy that contributes to adolescent PA (6).

Current objectives for PA in PE need refining as they are underpinned by low-quality evidence and contain unacknowledged differences in PA intensity and duration (2). Research must move beyond considering levels of MVPA in isolation. Future research may be warranted to develop an appreciation of how much objectively measured MVPA can be achieved within a typical PE lesson, while meeting the other multifaceted aims of PE, for instance, the need for developing physical literacy. While the quest for PA is important, this must not be at the expense of developing physically literate young people.

Finally, while PE may be reasonably expected to make a substantial contribution to children's daily PA, this must not sacrifice other important PE outcomes. Given their long-term value, these other markers of PE quality - such as the enjoyment of PA, or the development of physical literacy - need to be afforded renewed priority, perhaps by explicit integration into future objectives (2,10). To support the development of objectively determined PA objectives, in tandem with achieving the multifaceted requirements of PE, it is essential that education makes a full contribution to these public health debates. Acknowledging that interventions within PE generate only small increases in PA (10), it is now time to look beyond PE as a "silver bullet" for resolving the inactivity crisis, toward all segments of the school day. Importantly, what is at stake is not just achieving PA in PE, but encouraging lifelong participation in PA and the long-term health of children.

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